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Observations of the Leonids of 1899, *made at the University Observatory, Oxford.* By H. H. Turner, Savilian Professor.

Preparations were made to observe the expected shower, but came to nothing. Mr. Bellamy had about seven cameras ready and four in reserve, to photograph the trails in different parts of the sky, and exposed some plates on November 14, but with no result. Messrs. H. Mullis, B. Gray, and E. Gray kept a regular watch on the sky in turns of half an hour each from $10^{h}\cdot30$ to $18^{h}\cdot0$ on the nights of November 14 and 15; and about thirty members of the University passed these nights at the Observatory, some of them watching, others sleeping on the floor of the Lecture-room, so that they might be quickly roused and carry the news to different colleges if there was a sensational shower. But nothing out of the common was observed. The following notes of details may be recorded:—

November 13. Cloudy at midnight. From $15^{h}\,45^{m}$ to $16^{h}\,15^{m}$, G.M.T., 5 Leonids and 2 other meteors seen by Professor Turner.

Nov. 14. Cloudy from $10\frac{1}{2}^{h}$ to 14^{h}. Cleared between 14^{h} and 15^{h}, and became a splendid night. The Moon and bright stars seen close to horizon. Moon set at 17^{h}.

The following meteors were counted by Messrs. H. Mullis, B. Gray, and E. Gray:—

G.M.T. Nov. 14. h h	Observer.	Number Leonids.	Of Others.
15 to $15\frac{1}{2}$	H.M.	2	—
$15\frac{1}{2}$ „ 16	B.G.	4	1
16 „ $16\frac{1}{2}$	E.G.	3	2
$16\frac{1}{2}$ „ 17	H.M.	8	—
17 to $17\frac{1}{2}$	B.G.	9	—
$17\frac{1}{2}$ „ 18	E.G.	18	—
18 „ $18\frac{1}{2}$	H.M.	3	—

These observers were watching the radiant and its neighbourhood. A few other meteors not included in above were observed by Mr. Bellamy, who was in charge of the cameras in the dome, Mr. H. Hilton, Fellow of Magdalen, and Councillor G. C. Druce, who were with him, as follows:—

Sid. Time (Greenwich). h	m	s	
6	48	40	3rd mag. midway ζ and μ Leonis towards 20 Leonis path 12° long, rapid.
8	11	10	2° north of μ Leonis and R.A. 10^{h}.
8	12	25	East to west through Orion, long trail.
8	16	0	Near Procyon to Sirius, long trail.
8	25	10	In Leo.
8	56	10	Large meteor though Ursæ Min.
9	16	35	Near the zenith, the brightest seen during the night; caused a sudden glare of light over the landscape and left a trail for some minutes.

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About 6 others were seen in *Orion*, and quite 25 near *Leo*, but times or paths were not noted, most of them until 18^h would be included in the above counts.

November 15. Cloudy all night; rifts in clouds 17^h to 18^h, but no meteors seen through them.

November 16. 11^h to 18^h. Brilliantly clear at times, but no meteors seen by Mr. Bellamy, who kept an intermittent watch.

Observations of the Leonids of 1899 *November* 14 *and* 15, *made at the Radcliffe Observatory, Oxford.*

(*Communicated by A. A. Rambaut, M.A., D.Sc., Radcliffe Observer.*)

At the Radcliffe Observatory we made careful preparations for observing the *Leonid* shower this year.

Our attention was chiefly devoted to an attempt to photograph some of the meteor trails and to an enumeration of the meteors seen. The staff of the Observatory being limited in number, it seemed to me best to confine observations to these two objects; and as the results obtained by Professor Pickering and one or two others in recent years seem to show that even a few photographic trails will give a better determination of the actual position of the radiant point than a much larger number charted down by eye and hand, I decided, after some hesitation, not to attempt any observations by the latter method.

For the photographic observations a camera carrying a Ross portrait lens of 4½-inch aperture and about 18 inches focal length was attached to the declination axis of the Barclay 10-inch equatorial, the latter being used as a guiding telescope during the exposure of the plates. The camera was adapted for whole plates, which covered a field of about 30° by 20° on the sky.

From some experiments made previously with this apparatus by sweeping the telescope, we had concluded that if a meteor as bright as a first-magnitude star appeared in the neighbourhood of the radiant point during the exposure of a plate, we should be likely to obtain a photograph of its trail. The plates used were Edwards' Isochromatic Snap Shot Plates.

Unfortunately, however, although Mr. McClellan and I kept exposing plates from shortly after 15^h on the 14th until dawn put a stop to our observations, no trails were obtained.

Mr. Wickham and Mr. Robinson undertook the count of the meteors. They were stationed on the roof of the eastern wing of the Observatory tower. A cable had been temporarily laid to the chronograph, by which Mr. Wickham was enabled to register the time of appearance of each meteor to a fraction of a second. Mr. Robinson was also furnished with a pocket enumerator registering up to 12,000. Unfortunately, the richness of the display fell so far short of anticipation that the value of these